

Abstract:

We have heard this before. The definition of the global competition has changed. The competitive drivers of the 21st century are time and service (responsiveness and flexibility). The success of an enterprise is measured not only by the size of an organization, but in its ability to quickly respond to market changes with more efficient methods of production, improved levels of customer service and ability in harnessing its supply chain more efficiently to respond to its customer when they demand it.

One of the ways to achieve excellence is to make use of latest technology. Over the last couple of years, the manufacturers have got convinced that, with the use of latest technology, the efficiency, speed and performance of an organization improve dramatically.

In this direction, many small and medium enterprises (SMEs) have implemented ERP (Enterprise Resource Planning) as one of the technology tools to improve their performance. While some of these implementations have benefited organizations, there are still many others, who are not convinced with ERP's ability to address the dynamic changes of business. This could be largely due to the over expectation from ERP. Manufacturers today are finding means to address the problems that are not addressed by ERP.

This whitepaper on Supply Chain Management (SCM application) for SMEs is a little effort to highlight the crucial role and importance of supply chains to SMEs. It begins with a discussion about the business changes of recent times, how SMEs can grab an opportunity of these changes, the challenges that SMEs face and the means of addressing these challenges. ERP and SCM have already created considerable confusion on their abilities to address specific business needs among the companies planning to adapt enterprise solutions. Hence, there is an attempt to explain the differences between these applications. Finally, it summarizes the ways in which SMEs can effectively leverage these applications for greater productivity, competitiveness, and ultimately better customer satisfaction.

Changes in Business of SME segment:

Gone are the days where companies compete with each other. Today we see, supply chains competing against supply chains. Large manufacturers are narrowing down their supplier base to the one, who can meet their requirements. If seen objectively, this trend is actually beneficial to SME suppliers if they respond to their customer reliably and consistently. Since their customers are under great pressure to harness their supply chain, the necessity of using latest technologies like supply chain optimization is becoming more evident. The rapid penetration of these new technologies, also transforming the way business carried out. Larger customers are now outsourcing the business operations that do not fall under their core competence to the SMEs. Naturally, they expect their suppliers (SMEs) to be responsive, flexible and reliable. In addition, they are demanding collaboration and conformance to their supply chain processes.

What is responsiveness? It means that responsiveness to the exceptions rather than to the routine business functions. An enterprise has to be ready to respond to any unplanned events and demand. This responsiveness requires dependability, flexibility, cost effectiveness and of course good communication. Every customer thinks that his business is unique and expects service accordingly, tailored to his expectation. SME suppliers, thus have no option but to provide outstanding service to their customers.

Opportunities for SMEs:

SMEs have advantages on adapting to the change faster. They are smaller, and hence, much flexible in adapting to the change. They have tight integration and coordination between the different functions, and hence they are cost effective. Their business process workflows are simple, often because of the fact that very few managers manage most of these departments. Their simple, but responsible organization structure, and the business processes allow faster change and decision making, implies that it is easier for SMEs to comply with the changing customer regulations, adapt changes quickly to address the market needs.

Challenges for SMEs:

In an effort to comply with the market demands, in spite of their natural advantages, SMEs do have challenges to overcome. They are different from large companies. They have limited resources in both operations and infrastructure. They also tend to have limited market focus. Since competition is among supply chains, changing their thinking from being a part of an enterprise, to being a part of a supply chain is very important challenge. In spite of their advantage to adapt to the changes quickly and easily, most of the times, these changes are more dramatic and sudden. Most managers in SMEs are not prepared to this change, and they feel extremely uncomfortable. Of course, there is an ever-increasing pressure to reduce the cost by their customers, which is another big challenge.

Information plays a key role in the value chain. Most large customers have advanced applications to support their workflows, and they expect real time collaboration with their suppliers. Where as, SMEs, usually have multiple systems to manage their day-to-day business and hence critical information is not shared within the business functions real time. Due to this it is often observed that some manual tracking of information is carried out which is time consuming and many a times futile exercise. The result: - Missed opportunities, poor decision-making, poor execution, and ultimately low customer service. Because of this, real time collaboration with their customers is another big challenge for SMEs.

What SMEs should do

A simple definition of good supply chain performance is to get the right product to the right place at the right time at the lowest cost. Those who can meet the above definition will be highly valued and treated as a valuable partner in the chain. One of the key as-

pects of the change that will be beneficial to SMEs is shift from traditional manufacturing to demand driven manufacturing. Moving to a demand driven supply chain requires organization, process, and technology changes. SMEs must ready to share data with others in the supply chain, not as a routine practice, but as the change occur. While competing with their competitors, they should recognize their strength and focus on what differentiates them from others. They should have a transparent business practice that is visible to their partners so that in case of any untoward incidents, they can take appropriate decision along with the whole supply chain, thus not affecting their business relationship. They should be responsive in every aspects of the business including exception handling, demonstrate faster innovation, and reduced cost of the supplied product. All these can be achieved, using efficient manufacturing methods and process improvements.

While most of the above suggestions are policy driven, enterprise applications can assist these SMEs, enabling them to be more responsive and helping them to analyze their weakness and to take suitable decisions. Without greater access to advanced IT solutions, many of these strategies would fail to meet the performance objectives. In today's world, IT interoperability with business partners is must. Which means that the enterprise applications that they use should be of open standards, fit to their business practices, takes care of their specific functional needs, be responsive to the sudden changes, be integrated within and across the supply chains, supports exception handling, help them with least business disruptions and easy to implement, support & use. Of course, cost of their IT infrastructure needs to be kept low.

What ERP did to the SMEs?

At the macro level, ERP is a transactional system, capturing all the day-to-day activity of an enterprise. This is just basics. Obviously, an ERP system has become a crucial backbone to manufacturing companies. It provides the core infrastructure through which most other applications get and give information. ERP has tried to integrate different business functions within an enterprise so that information is shared among the business functions real time. Many of these ERPs can be linked with other systems, even that of business partners. For the companies with disintegrated systems, ERP came as a boon, which enable integration, coordination, and still address the functionalities of legacy applications. The value of ERP is further strengthened by the fact that it enabled management of business policies, automation of the workflows, and common repository of information. Most of these ERPs are web enabled, through which executives can access the information, communicate and automate the tasks, thus enabling rapid decision-making. Further, they enable sharing of information with external and internal business functions and eliminate the need to reenter data between the systems. ERP standardizes and systematizes processes, which enables operations to act as a cohesive and synchronized team, reducing error and data redundancy.

What more is required?

For many companies, ERP is not adequate to improve supply chain performance as it lacks execution focus and flexibility. Smaller companies define their industry more nar-

rowly than larger manufacturers. Hence, ERP as available in the market (vanilla ERP) might not be able to support their entire business requirement. Industry fit is very important. Organizations are moving their entire supply chain (from development to delivery) towards Lean manufacturing. However, the biggest challenge for them is lack of visibility in to the supply chain. Often, critical functionality needed to differentiate a company in the market will be missing in these vanilla applications and companies have to go for expensive customizations and work around to take care of these requirements. Most of the ERPs are not able to answers the questions like

- What is the demand?
- When the demand be shipped?
- Are there any demands that cannot be shipped?
- Which demands are going to be late and what is the delay?
- What are the causes for delayed demand or short supply?
- What are the future problems affecting the schedule?
- Given there are constraints, what best schedule that can be worked with?

Hence, SMEs are looking for specialized IT application, that help them in enabling a flexible supply and production processes. The expectation is that, the system should support demand driven order to delivery process, should very quickly respond to changing customer demand and enable accurate & relevant information flow along the supply chain. In other words, what really needed are the systems that help SMEs to

- Forecast more accurately based on their customer data
- Plan production and promise orders based on material and capacity constraints.
- Execute the given plan as planned.

Supply Chain Management (SCM) applications are designed to work exactly as above. In addition, SCM projects provide more insight in finding out the KPIs and matrices, which in turn can be used to tune organizational performance.

How much application functionality does a small or medium size enterprise really need? Many companies have not even implemented some of the basic modules of ERP, since they felt that it is not adding value in their business. In such a scenario, is there a need to consider any extended ERP applications? Would it not become a burden?

Not really. Industrial businesses have many similar problems, and SMEs are the one who are going to be at the receiving end if they do not address key issues adequately. One of the best approaches could be that to audit the company performance and to find out what IT application functionality will improve the performance.

What SCM can do?

After ERP, the most widely used application to improve supply chain performance is Supply Chain Management. SCM is a business system that integrates company's internal resources to manage and work with the external supply chain. Supply Chain Management helps businesses optimally coordinate the movement of goods and materials through the supply chain enabling accurate and efficient order fulfillment, even though the customer orders are constantly changing.

With SCM, a business can estimate future demand for its products, enabling planners to accurately estimate future need for supplies, and extends to "execution" with the planning of their plants, transportation, and logistics. Since time and service are the major market differentiators, managing asset and information flow across the supply chain is a challenge. SCM maximizes supply chain velocity by optimizing planning and execution. . The objective is to enhance the company's performance through improved manufacturing or service capability, market responsiveness, and customer-supplier relationship.

The demands made to a manufacturer by a client are dependent upon demands made by client's customers. In a supply chain, all suppliers, manufacturers, distributors and retailers have the same end customer. All of them will be successful, if they collaborate with each other in satisfying the demand. As mentioned earlier, the competition is not between organizations but between supply chains. If one supply chain fails to meet the demand, another supply chain will overtake and satisfy that customer.

The core Supply chain Management Solution consists of

- Collaborative demand forecasting and planning (Demand Management)
- Advanced planning and scheduling (Supply Planning and Production Planning + Scheduling)
- Transportation Planning and warehouse management
- Internal and External Collaboration (supply chain visibility)
- RFID

Demand Management:

There is no doubt that forecast accuracy is one of the biggest drivers of supply chain and organizational success. At the same time, it is also one of the most challenging business functions for manufacturing organizations. Demand management is all about developing an accurate, reliable view of market demand by identifying market trends, buying patterns and predicting changes in customer preferences. Demand management also includes the collaboration with customers on forecast to reach the most accurate demand picture. Today's Demand Management applications are quite user friendly, providing space for analysis, multidimensional views etc.

Advanced Planning & Scheduling (APS)

Whether performing Master Planning activity, scheduling the plant, promising an order or production plan requirements across multiple sites, constraint-based planning and scheduling (advanced planning and scheduling) is one of the best ways to dynamically adapt to changing customer demands and production resources. Supply Planning ensures the enterprise to meet the forecasted demand by generating a constrained, optimal supply plan. Production Planning and Scheduling is creating a detailed, executable plan to build forecasted goods. Collaboration is a part of supply planning since it enables open and honest communication with suppliers on material and capacity.

Transportation Planning and warehouse management:

Transportation and logistics are considered as part of supply chain execution since they help the enterprise to execute the transportation lifecycle. These applications perform different activities from planning, execution, proactive monitoring and even host these services on the web so that the stakeholders in the supply chain are aware of the status of

supply. Warehousing operations support value services like Labeling, Kanban, VMI, Kitting, RFID etc and most importantly they provide exception messages whenever there is a problem.

Internal & External Collaboration:

Most of the problems between the trading partners are result of lack of communication. They can be easily resolved by collaborating with the trading partners. This requires common understanding of problem, situation, and metrics. While demand collaboration allows the SMEs to forecast their demand properly, through supply collaboration, they can optimize their order fulfillment.

RFID:

One of the recent technologies of SCM suite, Radio frequency identification is a system that transmits the identity (in the form of a unique serial number) of an object or person wirelessly, using radio waves. Using this technology each item movement in a supply chain is tracked easily.

Nowadays these applications are even offered by many ERP vendors as either a single solution or separate SCM suite. Some of these applications even boast of tailored to specific industries. (Industry specific workflows).

Dint we have these functionalities in ERP?

Some of these functionalities even exist in ERP, but not at the detailed, expected level. Conventional ERP has fallen short in a few areas that are critical to today's business needs. While most of the ERPs support demand forecasting based on set of simple rules like moving average, weighted average etc, in SCM, demand planning application, there are several advanced pre-defined computations through which near accurate forecasting be achieved. Similarly most ERPs have infinite planning based on MRP, SCM applications offer constraint based finite scheduling techniques with options to tune wide range of parameters. While in ERP, most of the sourcing tables are static, in SCM application, dynamic data can be incorporated. ERP helps automate individual departments, but it has not extended its transactional benefits to the stakeholders in the supply-chain issues.

For years, an ERP system answers the fundamental questions like

What are we going to make?

What do we need to make the products?

What do we have now?

What raw materials do we need, and when?

What resources/capacity do we need and when?

Is this sufficient? Manufacturers need to know a lot more today to have a truly effective supply chain. There are number of fundamental weaknesses in the ERP logic such as

- ***Execution focus***

ERP systems were developed primarily for transaction processing, data collection, and data reporting. During the ERP implementation, lot of data is used to make it work, but the true benefit of any data can only be achieved if that data is analyzed properly and used for decision-making purposes using some data reporting techniques. ERP applications had limitations to support real time decision making.

- ***Flexibility***

ERP normally has static sourcing tables. ERP systems do provide planning capabilities, but the various constraints (material, capacity, and demand) are all considered separately, in relative isolation of each other. For example, they assume, fixed lead-times, infinite resource capacity, infinite supply capacity etc. Thus, it is not able to provide real-time simulations of adjustments in the constraints. In the dynamically changing business, these assumptions are very illogical and cause many scheduling problems. Further complicating matters, many companies have multiple ERP instances, numerous customizations to support the business functions and add on functionality, which, in turn, has increased support and maintenance costs.

On the other hand, Supply chain management addresses these limitations more effectively and at (usually) lower cost than ERP. Compared to ERP, SCM market is relatively newer, and SCM vendors have had an opportunity to identify the gaps in ERP and getting them incorporated in SCM. While ERP systems focused on transactions, SCM was geared towards analysis and planning. SCM Planning goes beyond traditional planning solutions like MRP (Manufacturing Resource Planning) and DRP (Distribution Resource Planning) by simultaneously considering demand, capacity, and material constraints. Supply Planning and scheduling in most of the SCM applications are based on TOC (Theory of Constraints) principle. In addition, recent SCM applications have visible maps of supply chain, providing entire visibility through the supply chain. Users can easily identify the nature of the problem in the supply chain (like demand, supply, manufacturing scheduling, and transportation), and they can even recognize where exactly the problem is.

Another reason why SCM applications are popular and considered value added is, growth in Information Technology. Enterprises have once considered isolated, are now part of the supply chain, thanks to latest technological advances like E-business, thus fulfilling the vision of SCM.

Following comparison between ERP and SCM provides more insight into SCM advanced planning functionality.

Key Differences between ERP and SCM:

	Enterprise Resource Planning	Supply Chain Management
Type	Transactional System	Planning and Analysis System
Level	Enterprise level	Supply Chain Level
Primary Function	Transaction Processing, Data Collection and Reporting	Planning and Optimization
Focus	Integration and Automation	Optimized planning and Exception Handling
Major Solutions	Master Data	Demand Management
	Materials Management	Demand Fulfillment
	Master Production Scheduling, MRP, Shop Floor, Capacity Planning	Supply Planning
	Project Management	Production Planning and Scheduling

	Manufacturing - Quality Management, Plant Maintenance, Engineering Changes	Transportation Planning
	Quality Management	Warehouse Management
	Plant Maintenance	Supply Chain Collaboration
	Financial Accounting, Costing and Fixed Assets	RFID
	Human Resources	
	Sales and Distribution	
Planning	Sequential Planning (Constraints are considered separately)	Concurrent Planning (All the constraints are considered)
Demand Management	Limited forecasting techniques	Dynamic and multi dimensional Forecasting techniques
Supply Planning	Assumes infinite capacity	Constrained Materials and Capacity Planning (TOC principle)
Production Planning	More of an execution system	Constrained capacity planning at the shop level (TOC principle)
Planning Parameters	Static	Dynamic (Time varying)
Resource Capacity	Fixed	Time varying
Functionality	Comprehensive transaction system	Focused Planning system
No. Of Users	Many	Few Specialized Users
Implementation	May take time	Normally faster implementation cycle
Sourcing Tables	Relatively Static	Dynamic

Based on the comparison (?) between ERP and SCM above, one can have question in mind -"Is it really fair to compare these two applications"? The answer is NO. A transactional system is never compared with a planning and optimization system. Though the real comparison between these two systems can only be done in their ability to carry out Planning, the focus of these two applications are entire different. As for Planning, ERP has tried to support the planning needs at higher level, SCM planning goes through depth of the dynamic planning parameters and provides realistic plan.

Conclusion:

How can an organization manage its supply chain more effectively? If it can foresee accurately what is going to happen in the future by taking into consideration all possible constraints and takes decision based on it. This will improve chances of gaining a competitive edge. Any supply organization, which participates and collaborates fully and effectively will be valued as trusted partners, and becomes strong link in the supply chain. To achieve this, SMEs need to develop flexible supply chain processes that can adapt to the needs of various customer segments. They must also develop supply chain strategy, processes and supporting systems that conform to current and future requirements.

Good collaborative demand planning, optimized supply chain planning and realistic replenishment planning and trustworthy collaboration with the trading partners are essential to effective SCM. There can be much further improvements like efficient transportation planning to minimize cycle time and to have optimized delivery schedules, effective warehouse management to improve the order fulfillment.

While ERP is backbone of many manufacturers in terms of integration and automation, SCM brings in value by improving Time to market. This implies that in order to have improved performance in terms of time and service, an organization must have an efficient transaction & accounting system (ERP) as well as advanced planning system. They MUST coexist.

Having said this, many SMEs might wonder as to - would it not be an expensive proposition and burden to implement SCM?

The basic supply chain applications have matured enough and available at far reasonable price tags and with much faster implementation cycle. One of the reasons is that, in the past, new technologies used to take long time to develop. Things have changed and now there are many suitable, affordable SCM solutions available to SME segment. Another development of the recent past is that convergence of ERP and SCM. Many ERP vendors have/are incorporated SCM functionality in their ERP products. Similarly even the SCM vendors are trying to adapt ERP functionality, although this process might take some time.

SCM was once viewed as a way to obtain a competitive advantage, companies are now beginning to perceive it as a logical and necessary extension of ERP.

About the Author:

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